

Elaine Y. Hsiao

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<https://hsiao.science/>

Education

- 09/2007 — 12/2012 **California Institute of Technology** Pasadena, CA
Doctor of Philosophy in Neurobiology
- 09/2003 — 12/2006 **University of California, Los Angeles** Los Angeles, CA
Bachelor of Science in Microbiology, Immunology and Molecular Genetics

Appointments

- 07/2020 — present **De Logi Associate Professor in Biological Sciences, UCLA Department of Integrative Biology & Physiology**
- 07/2015 — 06/2020 **De Logi Assistant Professor in Biological Sciences, UCLA Department of Integrative Biology & Physiology**
- 09/2017 — present **Joint Appointment, UCLA Department of Microbiology, Immunology & Molecular Genetics**
- 09/2015 — present **Joint Appointment, UCLA Department of Medicine, Digestive Diseases**
- 05/2016 — present **Member, UCLA Molecular Biology Institute**
- 01/2016 — present **Member, UCLA California NanoSystems Institute (CNSI)**
- 01/2016 — present **Member, UCLA Eli & Edyth Broad Center of Regenerative Medicine & Stem Cell Research (BRCS)**
- 10/2015 — present **Member, UCLA Brain Research Institute**
- 07/2015 — 07/2022 **Visiting Associate, Caltech Biology & Biological Engineering**
- 09/2014 — 07/2015 **Research Assistant Professor, Caltech Biology & Biological Engineering**
- 09/2013 — 09/2014 **Senior Research Fellow, Caltech Biology & Biological Engineering**
- 01/2013 — 09/2013 **Postdoctoral Scholar, Caltech**
Mentors: Rustem F. Ismagilov, Chemistry & Chemical Engineering
Sarkis K. Mazmanian, Biology & Biological Engineering
- 09/2007 — 01/2013 **Graduate Student, Caltech**
Mentor: Paul H. Patterson; Biology & Biological Engineering
- 03/2007 — 09/2007 **Associate, Pre-Clinical Formulations, Amgen, Inc.**

Academic and Professional Honors

- 6/2022 **Blavatnik National Award for Young Scientists Laureate in Life Sciences**
- 4/2022 **Innovators in Science Award, New York Academy of Sciences/Takeda Pharmaceuticals**
- 3/2022 **Lifetime Member, New York Academy of Sciences**

12/2021 W. M. Keck Foundation Junior Faculty Award
03/2021 2021 Sci-Founder Fellow
03/2021 UCLA Chancellor's Post-doctoral Mentoring Award
01/2021 NINDS Landis Mentoring Award for Outstanding Mentorship Finalist
07/2020 Max Planck Society Sabbatical Award
01/2020 Research Corporation for Science Advancement Scialog Fellow
05/2019 UCLA Life Sciences Excellence Award for Outstanding Research Publication
04/2019 John H. Walsh Young Investigator Research Prize
10/2018 Chan-Zuckerberg Initiative Ben Barres Career Acceleration Award
06/2018 New York Stem Cell Foundation Robertson Neuroscience Investigator
04/2018 UCLA Life Sciences Excellence Award in Educational Innovation
11/2017 Robert J. and Claire Pasarow Foundation Medical Research Award
10/2017 Packard Fellow in Science and Engineering
09/2017 Renew Life Research Excellence Award
07/2017 Klingenstein-Simons Fellow in Neuroscience
04/2017 UCLA Life Sciences Excellence Award for Outstanding Research Publication
01/2017 UCLA Chancellor's Post-doctoral Mentoring Award Nominee
02/2016 Alfred P. Sloan Research Fellow in Neuroscience
11/2015 Kavli Fellow of the National Academy of Sciences
10/2015 UCLA De Logi Chair in Biological Sciences
09/2015 Member, White House Office of Science & Technology Microbiome Forum
08/2015 TEDYouth Speaker
06/2015 National Geographic Emerging Explorer Award
09/2014 Caltech Environmental Microbial Interactions Career Award
08/2014 Forbes' "30 Under 30 in Science & Healthcare"
09/2013 NIH Director's Early Independence Award (DP5)
05/2013 2013 Caltech Everhart Lecturer
01/2013 Global Young Scientist Summit Travel Award, Singapore
03/2012 Keystone Symposium Scholarship
09/2012 TEDxCaltech Speaker
09/2012 Gregory O. & Jennifer W. Johnson Caltech Innovation Fellowship
01/2012 International Society for Developmental Neuroscience Travel Award, India
09/2011 NIH/NRSA Ruth L. Kirschstein Pre-doctoral Fellowship
09/2009 Autism Speaks Dennis Weatherstone Pre-doctoral Fellowship

Publications

Primary Research Articles (26)

*Hsiao lab members: * undergraduates, # graduate students, ^ postdoctoral fellows, ' staff members*

2022 Lynch JB[^], Gonzalez EL^{*}, Choi K^{*}, Faull KF, Seaman LC, Jewell T, Arellano A, Liang J, Yu KB[#], Paramo J', **Hsiao EY** (2022) *Turicibacter* modifies bile acids and host lipids in a strain-specific manner. *in review*. biorxiv: <https://doi.org/10.1101/2022.06.27.497673>

- 2022 Pronovost GN[#], Telang SS*, Chen AS*, Coley E JL[#], Vuong HE[^], Williams DW[#], Yu KB[#], Gharagoz BE*, Rendon TK', Paramo J', Kim R, **Hsiao EY** (2022) The maternal microbiome promotes placental development in mice. in review.
- 2022 An U, Shenhav L, Olson CA[#], **Hsiao EY**, Halperin E, Sankararaman S (2022) STENSL: microbial Source Tracking with Environment SeLection. *mSystems*, accepted in principle.
- 2021 Olson CA[#], Iniguez AJ[#], Yang GE*, Fang P[^], Pronovost GN[#], Jameson KG[#], Rendon TK', Paramo J', Barlow JT, Ismagilov RF, **Hsiao EY** (2021) Alterations in the gut microbiota contribute to cognitive impairment induced by the ketogenic diet and hypoxia. *Cell Host & Microbe*, 29:1378-92. PMID: 34358434. PMCID: PMC8429275.
- 2021 Coley E JL[#], Mayer EA, Osadchiy V, Chen Z, Zhang Y, **Hsiao EY**, Gao K, Bhatt R, Dong T, Vora P, Naliboff B, Jacobs J, Gupta A (2021) Early life adversity predicts brain-gut alterations associated with increased stress and mood. *Neurobiology of Stress*, 15:100348. PMID: 34113697. PMCID: PMC8170500.
- 2021 Vuong HE[^], Coley E JL[#], Kasantsev M[#], Cooke ME*, Rendon TK', Paramo J', **Hsiao EY** (2021) Interactions between maternal fluoxetine treatment, the maternal microbiome and fetal neurodevelopment in mice. *Behavioural Brain Research*, 410:113353. PMID: 33979656.
- 2021 Noble EE, Olson CA[#], Davis E, Tsan L, Chen Y, Schade R, Liu C, Suarez A, Jones RB, de La Serre C, Yang X, **Hsiao EY**^{``}, Kanoski S^{``} (2021) Gut microbial taxa elevated by dietary sugar disrupt memory function. *Translational Psychiatry*, 11:194. PMID: 33790226. PMCID: PMC8012713. ^{``}Co-corresponding authors
- 2020 Vuong HE[^], Pronovost GN[#], Williams DW[#], Coley E JL[#], Siegler EL*, Qiu A*, Kasantsev M[#], Wilson CJ*, Rendon T', **Hsiao EY** (2020) The maternal gut microbiota modulates fetal neurodevelopment in mice. *Nature*, 586:281-6. PMID: 32968276. PMCID: PMC7554197.
Highlighted in [Nature News & Views](#), [PennNeuroKnow](#), [The Conversation](#), [ScienceNews](#)
- 2020 Ahn I, Lang J, Olson CA[#], Ying Z, Zhang G, Byun H, Zhao Y, Kurt Z, Lulis AJ, **Hsiao EY**, Gomez-Pinilla F, Yang X (2020) Host genetic background and gut microbiota contribute to differential metabolic responses to high fructose consumption in mice. *Journal of Nutrition*, 150:2716-28. PMID: 32856048. PMCID: PMC7549307.
- 2020 Osadchiy V, Mayer EA, Gao K, Labus JS, Naliboff B, Tillisch K, Chang L, Jacobs JP, **Hsiao EY**, Gupta A (2020) Analysis of brain networks and fecal metabolites reveals brain-gut alterations in premenopausal females with irritable bowel syndrome. *Translational Psychiatry*, 10:367. PMID: 33139708. PMCID: PMC7608552.
- 2020 Williams DW, Vuong HE[^], Kim S, Lenon A, Ho K, **Hsiao EY**, Sung E, Kim R (2020) Indigenous microbiota protects against inflammation-induced osteonecrosis. *Journal of Dental Research*, 99:676-84. PMID: 32109361. PMCID: PMC7243424.

- 2019 Fung TC[^], Vuong HE[^], Luna CDG^{*}, Pronovost GN[#], Aleksandrova AA, Riley NG, Vavilina A[#], McGinn J['], Rendon T['], Forrest LR, **Hsiao EY** (2019) Intestinal serotonin and fluoxetine exposure modulate bacterial colonization in the gut. *Nature Microbiology*, 4:2064-73. PMID: 31477894. PMCID: PMC6879823.
Highlighted in [C&EN Chemistry and Engineering News 97:35](#), [Nature Research Communities](#), [Nature Reviews Gastroenterology & Hepatology](#)
- 2019 Labus JS, Osadchiy V, **Hsiao EY**, Tap J, Derrien M, Gupta A, Tillisch K, Le Nevé B, Grinsvall C, Ljungberg M, Öhman L, Törnblom H, Simren M, Mayer EA (2019) Evidence for an association of gut microbial Clostridia with brain functional connectivity and gastrointestinal sensorimotor function in patients with irritable bowel syndrome, based on tripartite network analysis. *Microbiome*, 7:45. PMID: 30898151. PMCID: PMC6429755.
- 2018 Lee K, Vuong HE[^], Nusbaum DJ['], **Hsiao EY**, Evans CJ, Taylor AMW (2018) The gut microbiota mediates reward and sensory responses associated with regimen-selective morphine dependence. *Neuropsychopharmacology*, 43:2606-14. PMID: 30258112. PMCID: PMC6224506.
Highlighted in [Nature Medicine 24:1630-2](#).
- 2018 Olson CA[#], Vuong HE[^], Yano JM['], Liang QY^{*}, Nusbaum DJ['], **Hsiao EY** (2018) The gut microbiota mediates the anti-seizure effects of the ketogenic diet. *Cell*, 173:1728-41. PMID: 29804833. PMCID: PMC6003870.
Highlighted in [New York Times](#), [Science 6394:1199-200](#), [Science Translational Medicine 446:eaau0471](#), Faculty 1000 (5 categories: Neuroscience, Genomics & Genetics, Immunology, Neurological Disorders and Physiology), [PNAS Journal Club](#), [Cell Host & Microbe 24:3-5](#).
- 2018 Osadchiy V, Labus JS, Jacobs J, Gupta A, Ashe-MacNalley C, **Hsiao EY**, Mayer EA (2018) Correlation of tryptophan metabolites with connectivity of extended central reward network in healthy subjects. *PLoS One*, 13:e0201772. PMID: 30080865. PMCID: PMC6078307.
- 2017 Labus JS, Hollister EB, Jacobs J, Kirbach K, Oezguen N, Gupta A, Acosta J, Luna R, Aagaard K, Versalovic J, Savidge T, **Hsiao E**, Tillisch K, Mayer EA (2017) Differences in gut microbial composition correlate with regional brain volumes in irritable bowel syndrome. *Microbiome* 5:49. PMID: 28457228. PMCID: PMC5410709.
- 2016 Wu W, **Hsiao EY**, Yan Z, Mazmanian SK, Patterson PH (2016) Placental interleukin-6 signaling controls fetal brain development and behavior. *Brain Behavior and Immunity*. 62:11-23. PMID: 27838335. PMCID: PMC5373986.
Highlighted in [Brain Behav Immun 62:9-10](#)
- 2015 Yano JM['], Yu K^{*}, Donaldson G, Shastri G^{*}, Ma L, Ann P, Nagler C, Ismagilov RF, Mazmanian SK, **Hsiao EY** (2015) Indigenous bacteria from the gut microbiota regulate host serotonin biosynthesis. *Cell*, 161:264-76. PMID:25860609. PMCID: PMC4393509.
Highlighted in [Cell 161:193-4](#), [Science Signaling 373:ec101](#), [Nature Reviews Gastroenterology & Hepatology 12:311](#), [ACS Chemical Biology 10:1157-1159](#), Faculty 1000 (5 categories: Neuroscience/Neurodevelopment, Chemical Biology/Biocatalysis, Neuroscience/Neuronal & Glial Biology, Physiology/Gastrointestinal Physiology, Gastroenterology & Hepatology)
- 2013 **Hsiao EY**, McBride SW, Hsien S, Sharon G, Hyde ER, McCue T, Codelli JA, Chow J, Reisman SE, Petrosino JF, Patterson PH^{*}, Mazmanian SK^{*} (2013) The microbiota modulates behavioral

and physiological abnormalities associated with neurodevelopmental disorders. *Cell*, 155:1451-1463. PMID: 24315484. PMCID: PMC3897394. *Authors contributed equally

Highlighted in [New York Times](#), [Cell 155:1446-8](#), [PNAS 111:2051-3](#), [Nature Reviews Neuroscience 15:65](#), [Nature Reviews Neurology 10:60](#), [Nature Reviews Microbiology 12:76-7](#), [Nature Reviews Drug Discovery 13:104](#), [CNS & Neurological Disorders Drug Targets 13:733-5](#), Faculty 1000 (8 categories: Microbiology, Pharmacology & Drug Discovery, Immunology, Neuroscience/Neuronal & Glial Biology, Environmental Microbiology, Cell Biology, Cellular Microbiology & Pathogenesis, Neuropharmacology), by [Dr. Tom Insel, NIMH](#), [Top 10 Autism Research Achievement of 2013 by Autism Speaks](#), [National Geographic](#), [Scientific American](#).

- 2012 Garay PA, **Hsiao EY**, Patterson PH, McAllister AK (2012) Maternal immune activation causes age- and region-specific changes in brain cytokines in offspring throughout development. *Brain Behavior and Immunity*, 31:54-68. PMID: 22841693. PMCID: PMC3529133.
- 2012 **Hsiao EY**, McBride SW, Chow J, Mazmanian SK, Patterson PH (2012) Modeling an autism risk factor in mice leads to permanent immune dysregulation. *Proceedings of the National Academy of Sciences*, 109:12776-81. PMID: 22802640. PMCID: PMC3411999.
[Top 10 Autism Research Achievement of 2012 by Autism Speaks](#), [Notable Paper of 2012 by Simons Foundation](#), ["Summer Scientific Breakthrough," Dr. Tom Insel, NIMH](#)
- 2012 Garbett, KA`, **Hsiao EY`**, Kalman S, Patterson PH, Mirnics K (2012) Effects of maternal immune activation on gene expression patterns in the fetal brain. *Translational Psychiatry*, 2:e98. PMID: 22832908. PMCID: PMC3337077. ``Authors contributed equally
- 2012 Malkova NV, Yu CZ, **Hsiao EY**, Patterson PH (2012) Maternal immune activation yields offspring displaying the three core symptoms of autism. *Brain Behavior and Immunity*, 26:607-16. PMID: 2210922. PMCID: PMC3322300.
- 2011 **Hsiao EY**, Patterson PH (2011) Activation of the maternal immune system induces endocrine changes in the placenta via IL-6. *Brain Behavior and Immunity*, 25:604-15. PMID: 21195166. PMCID: PMC3081363.
Highlighted in [Brain Behav Immun 25:602-3](#)
- 2010 Ito HT, Smith SE, **Hsiao E**, Patterson PH (2010) Maternal immune activation alters nonspatial information processing in the hippocampus of the adult offspring. *Brain Behavior and Immunity*, 24:930-41. PMID: 20227486. PMCID: PMC2897971.

Publications

Invited Review Articles (20)

*Hsiao lab members: * undergraduates, # graduate students, ^ postdoctoral fellows, ' staff members*

- 2022 Ozcan E[^], Lum GR[#], **Hsiao EY** (2022) Dietary interactions with the gut microbiota in refractory epilepsy. In Sampson T (Eds). *Microbiome in Neurological Disease, International Review in Neurobiology*. [in press](#).
- 2022 Yu LW[#], Agirman G[^], **Hsiao EY** (2022). The gut microbiome as a regulator of the neuroimmune landscape. *Annual Reviews of Immunology*. 40:143-167. PMID: 34990209.

- 2021 Agirman G[^], Yu KB[#], **Hsiao EY** (2021). Signaling inflammation across the gut-brain axis. *Science*, 374:1087-92. PMID: 34822299.
- 2021 Coley EJL[#] and **Hsiao EY** (2021). Malnutrition and the microbiome as modifiers of early neurodevelopment *Trends in Neuroscience*. 44:753-64. PMID: 34303552.
- 2021 Agirman G[^] and **Hsiao EY** (2021). Snapshot: The Microbiome-Gut-Brain Axis (graphical article). *Cell*. 184:P2524-2524.E1. PMID:33930299.
- 2021 Yu KB[#] and **Hsiao EY** (2021). Roles for the gut microbiota in regulating neuronal feeding circuits. *Journal of Clinical Investigation*, 131:e143772. PMID: 33998595. PMCID: PMC8121503.
- 2020 Fang P[^], Kazmi SA[#], Jameson KG[#], **Hsiao EY** (2020). The microbiome as a modifier of neurodegenerative disease risk. *Cell Host and Microbe*, 28:201-22. PMID: 32791113. PMCID: PMC7430034.
- 2020 Jameson KG[#], Olson CA[#], Kazmi SA[#], **Hsiao EY** (2020). Toward understanding microbiome-neuronal signaling. *Molecular Cell*, 78:577-83. PMID:32275853.
- 2020 Lum GR[#], Olson CA[#], **Hsiao EY** (2020) Emerging roles for the intestinal microbiome in epilepsy. *Neurobiology of Disease*. 135:104576. PMID: 31445165.
- 2019 Lynch JB[^] and **Hsiao EY** (2019) Microbiomes as sources of emergent host phenotypes. *Science*. 365:1405-9. PMID: 31604267.
Highlighted in Faculty 1000 (Life & Environmental Sciences)
- 2019 Pronovost GN[#] and **Hsiao EY** (2019) Perinatal interactions between the microbiome, immunity and neurodevelopment. *Immunity*, 50:18-36. PMID:30650376. PMCID: PMC6447295.
- 2018 Fields CT, Sampson TR, Bruce-Keller AJ, Kiraly DD, **Hsiao EY**, De Vries G (2018). Defining dysbiosis in disorders of movement and motivation. *Journal of Neuroscience*, 38:9414-22. PMID: 30381433. PMCID: PMC6209841.
- 2017 Mayer EA and **Hsiao EY** (2017) The gut and its microbiome as related to central nervous system function and psychological well-being. *Psychosomatic Medicine*. 79: 844-6. PMID: 28976454. PMCID: PMC5924442.
- 2017 Vuong HE[^], Yano JM[^], Fung TC[^], **Hsiao EY** (2017) The microbiome and host behavior. *Annual Reviews of Neuroscience*. 40: 21-49. PMID: 28301775. PMCID: PMC6661159.
Highlighted in Faculty 1000 (Microbiology/Microbial Evolution & Genomics)
- 2017 Fung TC[^], Olson CA[#], **Hsiao EY** (2017) Interactions between the microbiota, immune and nervous systems in health and disease. *Nature Neuroscience*. 20:145-55. PMID: 28092661.
- 2016 Vuong HE[^], **Hsiao EY** (2016) Emerging roles for the gut microbiome in autism spectrum disorder. *Biological Psychiatry*. 81: 411-23. PMID: 27773355. PMCID: PMC5285286.

- 2014 **Hsiao EY** (2014) Gastrointestinal issues in autism spectrum disorder. *Harvard Review of Psychiatry* 22:104-111. PMID: 24614765.
- 2013 **Hsiao EY** (2013) Immune dysregulation in autism spectrum disorder. In Konopka G, Harris A, Jenner P (Eds). *Neurobiology of Autism, International Review in Neurobiology* 113:269-302. PMID: 24290389.
- 2012 **Hsiao EY**, Patterson PH (2012) Placental regulation of maternal-fetal interactions and brain development. *Developmental Neurobiology* 72:1317-26. PMID: 22753006.
- 2012 **Hsiao EY**, Patterson PH (2012) Immune involvement in autism. *Autism*, S1.
- Publications *Invited Preview and Perspective Articles* (13)
*Hsiao lab members: * undergraduates, # graduate students, ^ postdoctoral fellows, ' staff members*
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- 2022 Özcan E[^] and **Hsiao EY** (2022). “Are changes in the gut microbiome a contributor or consequence of autism”—why not both? *Cell Reports Medicine*. 3:100505.
- 2021 Yu LW[#] and **Hsiao EY** (2021). IL-33 changes our “gut feelings” about serotonin. *Immunity*. 54:9-11. PMID: 33440138.
- 2020 Olson CA[#], Lum GR[#], **Hsiao EY** (2020). Ketone bodies exert ester-ordinary suppression of Bifidobacteria and Th17 Cells. *Cell Metabolism*. 31:1049-51. PMID: 32492391.
- 2020 Fang P[^] and **Hsiao EY** (2020). Gut microbes tune inflammation and lifespan in a mouse model of amyotrophic lateral sclerosis. *Nature*. 582:34-35. PMID: 32405038.
- 2020 Fang P[^] and **Hsiao EY** (2020). Mitochondrial and purinergic dysregulation promote abnormal behavior in mice. *Trends in Immunology*. 41:97-9. PMID: 31948872.
- 2019 Jameson KG[#] and **Hsiao EY** (2019). A novel pathway for microbial metabolism of levodopa. *Nature Medicine*. 25:1195-7. PMID: 31388180. PMCID: PMC7004239.
- 2019 **Hsiao EY** (2019) The neuroimmune collective, in “Voices: The next quarter century”. *Immunity*, 50: 769-777. PMID:30995498.
- 2019 Vuong HE[^] and **Hsiao EY** (2019) Gut microbes join the social network. *Neuron*. 101:196-8. PMID:30653931. PMCID: PMC6661156.
- 2018 **Hsiao EY** (2018) Decoding states and contexts, in “Setting the stage for the next generation of neuroscience”. *Neuron*. 99:11-12. PMID: 30001505.
- 2018 Kentner AC, Bilbo SD, Brown AS, **Hsiao EY**, McAllister AK, Meyer U, Pearce BD, Pletnikov MV, Yolken RH, Bauman MD (2018). Maternal immune activation: Reporting guidelines to improve the rigor, reproducibility and transparency of the model. *Neuropsychopharmacology*, 44:245-58. PMID: 30188509. PMCID: PMC6300528.

- 2018 Jameson KG[#] and **Hsiao EY** (2018) Linking the gut microbiome to a brain neurotransmitter. *Trends in Neuroscience*. 41:413-4. PMID: 29933773.
- 2017 Pronovost GN[#] and **Hsiao EY** (2017) Microbes REV up host metabolism around the clock. *Immunity*. 47:618-20. PMID: 29045896.
- 2016 Olson CA[#], Vuong HE[^], **Hsiao EY** (2016) Microbial modulators of host behavior. In ‘The Microbial Olympics 2016’. *Nature Microbiology*. 1:16122. PMID: 27573121.
- Publications *Invited Books and Book Chapters (8)*
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- Hsiao lab members: * undergraduates, # graduate students, ^ postdoctoral fellows, ' staff members*
- 2022 Agirman G[^], **Hsiao EY** (2022) A role for the microbiota in neurodevelopmental disorders. In Hyland N, Stanton C (Eds.). *The Gut-Brain Axis: Dietary, Prebiotic and Probiotic Interventions on the Microbiota*, 2nd Edition. Academic Press. pp. 305-18. in press.
- 2020 **Hsiao EY**, Braun J, Powell N (2020) The commensal microbiota and its relationship to homeostasis and disease. In Smith PD, MacDonald T, Blumberg R (Eds.). *Principles of Mucosal Immunology*, 2nd Edition. Garland Science, Chapter 19.
- 2018 **Hsiao EY**, as a member of: National Academies of Sciences, Engineering and Medicine; Committee on Advancing Understanding of the Implications of Environmental-Chemical Interactions with the Human Microbiome (2018) Environmental Chemicals, the Human Microbiome and Health Risk: A Research Strategy. *The National Academies Collection: Reports funded by the National Institutes of Health*. National Academies Press. Washington DC. PMID: 29431953.
- 2016 Yano J['], **Hsiao EY** (2016) A role for the microbiota in neurodevelopmental disorders. In Hyland N, Stanton C (Eds.). *The Gut-Brain Axis: Dietary, Prebiotic and Probiotic Interventions on the Microbiota*. Academic Press. pp. 305-18.
- 2016 Malkova N, **Hsiao EY** (2016) Non-genetic causes of autism spectrum disorders: the role of the immune system. In Sala C, Verpelli C (Eds.). *Neuronal and Synaptic Dysfunction in Autism Spectrum Disorder and Intellectual Disability*. Academic Press, pp. 65-76.
- 2015 Malkova N, Wu W, **Hsiao EY** (2015) Modeling the maternal immune activation risk factor for schizophrenia. In Pletnikov M, Waddington J (Eds.). *Modeling the Psychopathological Dimensions of Schizophrenia and Related Psychoses*. Academic Press, pp. 175-193.
- 2011 **Hsiao EY**, Bregere C, Malkova N, Patterson PH (2011) Modeling features of autism in rodents. In Amaral DG, Dawson G, Geschwind DH (Eds.), *Autism Spectrum Disorders*. New York: Oxford University Press, pp. 935-62.
- 2010 Smith SE, **Hsiao E**, Patterson PH (2010) Activation of the maternal immune system as a risk factor for neuropsychiatric disorders. In Zimmerman, AW; Connors, SL (Eds.), *Maternal Influences on Fetal Neurodevelopment*. New York: Humana Press, pp. 289-307.

Research Patents (12)

*Hsiao lab members: * undergraduates, # graduate students, ^ postdoctoral fellows, ' staff members*

- 2021 Lum GR[#], **Hsiao EY** (2021) Compositions and Methods for Inhibiting Seizures. UCLA. Provisional Application Number: 63/285,267.
- 2021 Lynch JB[^], Gonzalez EL^{*}, Choi K^{*}, **Hsiao EY** (2021) Compositions and Methods for Modifying Bile Acids to Regulate Lipid and Steroid Metabolism. UCLA. Provisional Application Number: 63/288,980. [licensed]
- 2019 Olson CA[#], Iniguez A[#], **Hsiao EY** (2019) Compositions and Methods for Modulating Cognitive Behavior. UCLA. Provisional Application Number: 62/855,290.
- 2019 Vuong HE[^], **Hsiao EY** (2019) Compositions and Methods for Modulating Maternal Microbiomes. UCLA. Provisional Application Number: 62/844,503.
- 2019 Pronovost GN[#], **Hsiao EY** (2019) Compositions and Methods for Regulating Uterine and Placental Growth. UCLA. Provisional Application Number: 62/817,629.
- 2019 Fung TC[^], **Hsiao EY** (2019) Compositions and Methods for Modulating Lipid and Steroid Metabolism. UCLA. Provisional Application Number: 62/815,760. [licensed]
- 2017 Needham B, **Hsiao EY**, Fischbach M, Patterson PH, Mazmanian SK. (2017) Modulation of Microbial Synthesis of 4-Ethylphenol and 4-Ethylphenyl Sulfate in Behavior and Disease. Caltech. Patent Number: 11,224,624. [licensed]
- 2016 Olson CA[#], Vuong HE[^], Yano JM['], **Hsiao EY** (2016) Compositions and Methods for Inhibiting Seizures. UCLA. Patent Number: 11,129,858. [licensed]
- 2015 **Hsiao EY**, Yano JM['] (2015) Microbe-based Regulation of Serotonin Biosynthesis. Caltech/UCLA. Publication Number: US 2016/0058808. [licensed]
- 2015 **Hsiao EY**, Wu W, Mazmanian SK, Patterson PH (2015) Compositions and Methods Comprising Bacteria for Improving Behavior in Neurodevelopmental Disorders. Caltech. Patent Number: 10,124,025. [licensed]
- 2013 **Hsiao EY**, McBride S, Patterson PH, Mazmanian SK (2013) Diagnosis and Treatment of Autism Spectrum Disorder. Caltech. Patent Number: 10,220,089. [licensed]
- 2011 **Hsiao EY**, McBride S, Chow J, Patterson PH, Mazmanian SK (2011) Probiotic Therapies for Autism. Caltech. Patent Number: US 9,452,189. [licensed]

Extramural Commercial Service and Entrepreneurship

- 04/2022 — present **Scientific Consultant, Hypothesis Fund**
- 06/2020 — present **Co-founder, Kanobo**

04/2020 — present	Co-founder, Purpose Bio
03/2018 — present	Co-founder, Bloom Science
01/2018 — present	Scientific Advisor, Holobiome
12/2017	Member, Medical Advisory Panel, Renew Life
03/2016 — 09/2016	Scientific Consultant, Kaleido Biosciences
12/2013 — 12/2016	Co-founder, Axial Therapeutics

Invited Research Talks (2015-present)

2022 (accepted)	<p>Microbiome interactions with the nervous system in health & disease</p> <ul style="list-style-type: none"> — Boston Children’s Hospital Department of Pathology Seminar Series (virtual) — Chan Zuckerberg Institute Neurodegeneration Challenge Network Webinar (virtual) — Keystone Symposium, Vertebrate Sensory Systems. Tahoe City, CA. — University of Maryland Neuroscience & Cognitive Science Colloquium. College Park, MA. — Keystone Symposium, Neuronal Control of Appetite/Gut-Brain Axis. Banff, Canada. <i>Session Chair</i> — NIH/NIDA Brain Development Research Consortium Seminar (virtual) — New York Stem Cell Foundation Innovators Meeting. Montauk, NY. — 5th Annual Metabolic Health Summit. Santa Barbara, CA. — Northwestern University Trainee-Nominated Seminar Series. Evanston, IL. — Vanderbilt Institute for Infection, Immunology and Inflammation Seminar Series. Nashville, TN. — Cell Symposium, The Neuro-Immune Axis. Lisbon, Portugal.
2021	<p>Host-microbiome interactions modify environmental risk for cognitive impairment/ The maternal microbiome and early neurodevelopment</p> <ul style="list-style-type: none"> — Keystone Symposium, The Microbiome: From Mother to Child (virtual). <i>Session Chair</i>. — University of Pennsylvania Mahony Institute for Neuroscience Seminar Series (virtual) — Harvard Chan Microbiome in Public Health Center Symposium (virtual) — International Mind, Mood & Microbes Symposium (virtual). <i>Session Chair</i> — LA Bioscience Ecosystem Summit (LABEST) 2021 (virtual). <i>Panel Moderator</i> — New York Stem Cell Foundation Annual Meeting (virtual) — University of Chicago Microbiology Seminar Series (virtual) — Keystone Symposium, Neuroimmune Interactions in Health and Disease. Keystone, CO. (virtual) — Department of Defense, Army Research Office, Multidisciplinary University Research Initiative Meeting. <i>Organizer</i>. (virtual) — Global Symposium on Dietary Therapies for Epilepsy and other Neurological Disorders. Brighton, UK. (virtual) — Oklahoma Center for Adult Stem Cell Research Distinguished Lecture Series. (virtual) — American Epilepsy Society Annual Meeting. Chicago, IL. — USC Diabetes and Obesity Research Institute and USC Keck Division of Endocrinology Grand Rounds. Los Angeles, CA. (virtual) — American College of Neuropsychopharmacology (ACNP) Annual Meeting. San Juan, PR.

**The maternal microbiome and early neurodevelopment/
Host-microbiome interactions through the serotonergic system**

- Nature and Nature Medicine Conference: The NextGen Immunology. Weizmann Institute. Rehovot, Israel. *Plenary Speaker*.
- Stanford Microbiology & Immunology Seminar Series. Palo Alto, CA.
- Emerging Opportunities for Mathematics in the Microbiome Workshop. Los Angeles, CA.
- UCLA Neurogenetics Seminar Series. Los Angeles, CA.
- UCSD Center for Microbiome Innovation International Microbiome Meeting. San Diego, CA.
- UCSD Neuroscience Graduate Program Seminar Series. San Diego, CA.
- Association of Medical School Pediatric Department Chairs Annual Meeting. Long Beach, CA.
- 8th Global Network Forum on Infection and Immunity. Chiba, Japan.
- New York Stem Cell Foundation Annual Meeting. (virtual)
- Department of Defense, Army Research Office, Multidisciplinary University Research Initiative Meeting. *Organizer*. (virtual)
- Towards Targeted Therapies for Neurodevelopmental Disorders. Children’s Hospital Pennsylvania (virtual).
- Champalimaud Research Centre Seminar Series. (virtual).
- Yale Microbiology Seminar Series. (virtual).
- Max Planck Institute Biomedical Sciences Symposium. (virtual)
- NINDS Metabolism-based Therapies for Epilepsy Workshop. (virtual).
- Alimentary Pharmabiotic Centre Symposium. (virtual).
- Annual KetoConference 2020. (virtual).

**Microbial modulation of seizure susceptibility in refractory epilepsy/
Bacterial responses to host serotonin**

- International Mind, Mood & Microbes Symposium. Amsterdam, Netherlands.
- Harvard Medical School Microbiology and Immunology Seminar Series. Cambridge, MA.
- Caltech Center for Environmental Microbial Interactions Annual Meeting. Pasadena, CA.
- UCSD Quantitative Biology, Center for Microbiome Innovation Seminar Series. La Jolla, CA.
- Keystone Symposium, Microbiome: Chemical Mechanisms and Biological Consequences. Montreal, Quebec.
- Experimental Biology; American Physiological Society Joint Presidential Symposium on the Microbiome in Physiology and Pharmacology. Orlando, FL. *Plenary Speaker*.
- Department of Defense, Army Research Office, Multidisciplinary University Research Initiative Meeting. Pasadena, CA. *Organizer*.
- UCLA Biosciences Innovation Meeting. Los Angeles, CA.
- Department of Defense Tri-Service Microbiome Consortium. Natick, MA.
- Kallyope Invited Speaker. NYC, NY.
- New York Stem Cell Foundation Annual Meeting. NYC, NY.
- Max Planck Institute for Developmental Biology Distinguished Speaker Seminar Series. Tuebingen, Germany.
- Epilepsy Precision Medicine Annual Meeting. Washington DC.
- Cell Symposium on the Neuroimmune Axis. Long Beach, CA.
- International Conference of Childhood Disability. Anaheim, CA. *Mac Keith Keynote Speaker*.
- Department of Biology, Denison University. Denison, OH. *2019 Anderson Lecturer*.
- American Epilepsy Society Annual Meeting. Baltimore, MD.
- Max Planck Society Living Systems II Symposium. Tuebingen, Germany.

2018

Microbial modulation of seizure susceptibility in refractory epilepsy/

Bacterial responses to host serotonin

- Transformations of the Human Microbiome, Berggruen Institute. Los Angeles, CA.
- Department of Psychology, Mount Holyoke College. MA. *2018 Hastorf Lecturer.*
- Department of Defense, Army Research Office, Multidisciplinary University Research Initiative Meeting. Pasadena, CA. *Organizer.*
- UCSF Microbial Pathogenesis and Host Defense Seminar Series. San Francisco, CA.
- Novartis Invited Speaker. San Francisco, CA.
- Vollum Institute Seminar Series, Oregon Health and Science University. Portland, OR.
- USC Neurobiology Seminar Series. Los Angeles, CA.
- Office for Science and Technology of the Embassy of France Symposium on The Human Microbiome- Time for Effective Translation. Los Angeles, CA.
- Department of Defense Tri-Service Microbiome Consortium. Bethesda, MD. *Keynote Speaker.*
- Simons Foundation Annual Meeting. New York City, NY.
- Society of Biological Psychiatry Annual Meeting. New York City, NY. *Plenary Speaker.*
- FASEB Translational Neuroimmunology. Snowmass, CO. *Session Chair.*
- UCLA Depression Grand Challenge Symposium. Los Angeles, CA.
- Packard Foundation Annual Meeting. San Diego, CA.
- Columbia University Neuroscience Seminar Series. New York City, NY.
- UCLA Neurology Grand Rounds. Los Angeles, CA.

2017

Gut microbes and serotonin biology /

Neuroimmune contributions to neurodevelopmental disease

- Gordon Research Conference on Neuroimmunology. Ventura, CA.
- NIH NHLBI Cell Biology & Physiology Center Seminar Series. Bethesda, MD.
- UCLA Molecular Biology Institute Seminar Series. Los Angeles, CA
- UCLA Synapse to Circuits Seminar Series. Los Angeles, CA.
- Stanford Immunology Graduate Student Seminar Series. Palo Alto, CA.
- Tufts Neuroscience Symposium. Boston, MA.
- Karolinska Institutet Nobel Conference on the Microbiome. Stockholm, Sweden.
- International Society of Nutrigenetics and Nutrigenomics Annual Congress. Los Angeles, CA.
- Washington University School of Medicine, St. Louis; Center for Neuroimmunology and Neuroinfectious Diseases Mini-Symposium. St. Louis, MO.
- University of California, Riverside Microbiology Seminar Series. Riverside, CA.
- Neuron/Cell Satellite Symposium on Big Questions in Neuroscience. Washington DC.
- Society for Neuroscience Annual Meeting, Symposium on Neuroimmune Interactions. Washington DC.
- Keystone Symposia Frontiers of Serotonin Beyond the Brain. Park City, UT
- American College of Neuropsychopharmacology Annual Meeting, Palm Springs, CA.

2016

Microbiome interactions with the nervous system

- UCSD Changing Microbiomes for Health Symposium, San Diego, CA.
- UCLA Arrowhead Microbial Genomics Meeting. Arrowhead, CA.
- American Society of Microbiology Annual Meeting. Boston, MA. *Session Chair.*
- Harvard Symposium on Probiotics. Cambridge, MA.
- Karolinska Institutet Nobel Forum Gut-Brain Axis Symposium. Stockholm, Sweden. *Keynote*

Speaker.

- Experimental Biology (EB) Annual Meeting. San Diego, CA. *Session Keynote Speaker.*
- MIT-Harvard Symposium on Health & Ventures in the Microbiome. Cambridge, MA. *Keynote Speaker.*
- Neurobiology of Stress Workshop. Newport Beach, CA.
- American Association for the Advancement of Science (AAAS) Annual Meeting. Chicago, IL
- UCLA Molecular, Cellular, Integrative Physiology Annual Retreat. *Plenary Speaker.*
- UCLA Center for Neurobiology of Stress Annual Symposium. *Keynote Speaker.*
- International Nanobiotechnology Annual Symposium. Los Angeles, CA.
- UCLA Cousins Center for Psychoneuroimmunology Seminar Series. Los Angeles, CA
- UCLA Microbiome Center Seminar Series. Los Angeles, CA.

2015

Neurochemicals and the microbiome

- Harvard Neuroscience Graduate Program Spring Symposium. Cambridge, MA.
- Canadian College of Neuropsychopharmacology Annual Meeting. Ottawa.
- Columbia University/New York Psychiatric Institute Grand Rounds. New York City.
- European College of Neuropsychopharmacology Annual Meeting. Amsterdam.
- National Academy of Sciences/Kavli Foundation Frontiers in Science Meeting; Newport Beach, CA. *Session Chair.*
- World Psychiatric Association International Conference. Taipei, Taiwan.
- UCLA Broad Stem Cell Center Research Center. Los Angeles, CA.
- UCLA Medical Fellows Seminar Series. Los Angeles, CA.
- UCLA California NanoSystems Institute Microbiome Seminar Series. Los Angeles, CA.
- UCLA Synapse to Circuits Seminar Series. Los Angeles, CA.
- UCLA Microbiome Center Seminar Series. Los Angeles, CA.
- Keystone Symposium: Understanding Biochemical Transformations in the Human Microbiome. Big Sky, MT. *Session Chair*
- International Human Microbiome Consortium Annual Meeting. Luxembourg.
- NIH High Risk High Reward Symposium. Bethesda, MD